

**Updated Energy Savings Analysis for Title 20 Standards Development Analysis of
Standards Options For Single-Voltage External AC to DC Power Supplies**

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A number of slight modifications to the proposed language of the standard warranted a revised energy savings estimate for the Tier 1 portion of the standard. These revisions (from the CASE report dated May, 3 2004) include:

- 1) The inclusion of *ac-ac power supplies* in the definition of the products to be covered by the standard
- 2) The inclusion of *external power supplies with output power up to 250 watts* in the definition of products to be covered by the standard
- 3) The exclusion from of *some battery charger products that have indicator lights and chemistry type selector switches* from the definition of products to be covered by the standard
- 4) The increase of the stringency of the standard to harmonize with ENERGY STAR's voluntary standard going into effect in late 2004 or early 2005.

Changes to the definition of products to be covered (items 1 through 3 above) are not quantifiable in the time allotted for this revised savings estimate because it would require deviating significantly from the methodology originally used to generate the market information. At the same time, items 1 through 3 are likely to have a minimal effect on the overall energy savings. Items 1 through 3 were primarily added to a) harmonize with international efforts and b) more clearly define the definition of the products covered by the standard. Items 1 and 2 will likely increase the energy savings under this standard and item 3 will likely slightly decrease the energy savings. We suspect that these three effects would either cancel out, changing the energy savings estimate not at all, or would result in a slight increase in the energy savings.

Item 4 is quantifiable and increases the energy savings by roughly 8% overall in first year savings under Tier 1 of the standard (Increase from 129.7 GWh to 140.7 GWh in the first year). Please see spreadsheet entitled "CEC Power Supply Standards Savings Estimate6 Tier1.xls" There are no quantifiable changes to the savings estimates in Tier 2 of the standard although the same qualitative arguments associated with items 1 through 3 are applicable.

Table 1: Revised Energy Savings Estimates for Tier 1 External Power Supply Standard

| <i>Power Supply Output Power (Watts)</i> | <i>Lifetime (years)</i> | <i>Average Annual Unit Energy Saving (kWh)</i> | <i>Annual Unit Cost Savings</i> | <i>Annual Unit Sales in CA for 2003 (millions)</i> | <i>Total First Year Energy Savings During one year of sales (GWh)</i> | <i>Incremental Cost</i> | <i>Simple Payback (years)</i> |
|--|-------------------------|--|---------------------------------|--|---|-------------------------|-------------------------------|
| <2.5 | 5 | 1.96 | \$ 0.22 | 3.40 | 6.7 | \$0.30 | 1.39 |
| 2.5-<4.5 | 5 | 3.17 | \$ 0.35 | 3.40 | 10.8 | \$0.30 | 0.86 |
| 4.5-<6 | 5 | 2.99 | \$ 0.33 | 4.60 | 13.8 | \$0.40 | 1.22 |
| 6-<10 | 5 | 4.25 | \$ 0.47 | 4.70 | 20.0 | \$0.50 | 1.07 |
| 10-<24 | 5 | 6.87 | \$ 0.76 | 5.40 | 37.1 | \$0.63 | 0.83 |
| >24 | 5 | 8.73 | \$ 0.96 | 6.00 | 52.4 | \$0.80 | 0.83 |
| Total | | | | 27.5 | 140.7 | | |

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| No Load or Unplugged Modes (AC Input watts) | | | | | | | | | | Active Mode (DC Output watts) | | | | | | | | | |
|---|--------------------------|-----------------------|--------------------------|-----------------------|--------------------------|-----------------------|--------------------------|--------------------------------------|------|-------------------------------|--------------------------|-----------------------|--------------------------|-----------------------|--------------------------|-----------------------|--------------------------|--------------------------------------|------|
| Output | Unplugged | No Load | 25% Rated Load | 50% Rated Load | 75% Rated Load | 100% Rated Load | Totals | Total | | Output | Unplugged | No Load | 25% Rated Load | 50% Rated Load | 75% Rated Load | 100% Rated Load | Totals | Total | |
| Power Bin (watts) | Fraction of time at load | Average Watts at load | Fraction of time at load | Average Watts at load | Fraction of time at load | Average Watts at load | Fraction of time at load | Average Watts per Bin in Active Mode | Time | Power Bin (watts) | Fraction of time at load | Average Watts at load | Fraction of time at load | Average Watts at load | Fraction of time at load | Average Watts at load | Fraction of time at load | Average Watts per Bin in Active Mode | Time |
| <2.5 | 35% | 0 | 25% | 0.70 | 20% | 0.4 | 20% | 0.4 | 14% | 0.8 | 20% | 0.8 | 20% | 0.8 | 20% | 0.8 | 20% | 0.8 | 100% |
| 2.5-<4.5 | 20% | 0 | 15% | 1.14 | 20% | 0.8 | 20% | 0.8 | 30% | 2.0 | 20% | 2.0 | 30% | 2.0 | 14% | 2.3 | 1% | 3.0 | 100% |
| 4.5-<6 | 30% | 0 | 25% | 0.84 | 20% | 1.3 | 20% | 1.3 | 15% | 2.5 | 20% | 2.5 | 30% | 2.5 | 9% | 3.8 | 1% | 5.0 | 100% |
| 6-<10 | 10% | 0 | 10% | 0.90 | 24% | 2.0 | 20% | 2.0 | 30% | 4.0 | 20% | 4.0 | 25% | 2.5 | 25% | 6.0 | 1% | 8.0 | 100% |
| 10-<24 | 10% | 0 | 20% | 1.36 | 28% | 4.3 | 20% | 4.3 | 26% | 7.1 | 20% | 7.1 | 15% | 12.8 | 1% | 17.0 | 1% | 21.05 | 100% |
| >24 | 15% | 0 | 15% | 1.93 | 34% | 11.3 | 25% | 28.4 | 10% | 33.8 | 1% | 45.0 | 1% | 45.0 | 1% | 45.0 | 1% | 21.05 | 100% |
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